ADDITIONAL FEE:

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R E M A R K S

The Office Action issued April 7, 2003 has been received and its contents have been carefully considered.

Claim 24 has been amended to delete the phrase "forming a waffle-like configuration" which was objected to by the Examiner.

A new claim 26 has been added. This claim is identical to claim 25, except that it is dependent from claim 21.

The applicant herein wishes to thank the Examiner in charge of this application, Ms. Ula Corinna Ruddock, for the courtesy and cooperation she extended applicant's undersigned counsel during the personal interview kindly granted on July 29, 2003. At the interview, applicant's counsel explained how the adhesive thickness in the laminate of Austin et al. could be calculated, and pointed out that this thickness was many times smaller than the adhesive thickness in applicant's laminate. The Examiner agreed that the claims, as presently written, do overcome the Austin et

al. reference; however, she indicated that a further search would be carried out before this application were allowed.

Set forth below is a summary of applicant's arguments.

Claims 21-25 stand rejected under 35 USC §103(a) as being unpatentable over the U.S. Patent No. 5,415,925 to Austin et al. This rejection is respectfully traversed for the reasons given below:

I. The Invention

The object of the invention is a three-layer air-permeable laminate, which under tensile stress is reversibly extendible, and which as a consequence returns to its original shape when the stress is relieved. The extension properties are created by a rubber-elastic middle layer. This middle layer fulfils two functions. On the one hand, it brings about adhesion between the two outer layers, which consist of fiber material. On the other, the middle layer is designed in such a way that tensile forces applied to the laminate can be absorbed in an elastic manner by the middle layer. The laminate according to the invention is, as a consequence, not only a flexible laminate but also an elastic material.

The middle layer consists of a rubber-elastic latticework, which is extendible under tensile stress, and which contracts again when the stress is relieved. The force which can be transferred from the elastic latticework is dependant upon the mass of the elastic material. Accordingly, it is possible for greater forces to be transferred with a latticework or network of thick rubber-elastic strands than with a network of fine filaments. For the elasticity of the laminate it is therefore of substantial inventive significance that the middle layer consists of rubber-elastic strands, which exhibit a thickness from 0.1 to 1.5 mm (i.e., 100 μm to 1500 μm).

The latticework which forms the middle layer is produced from adhesive strands, and specifically by the use of a melt adhesive, which solidifies into the rubber-elastic material at room temperature. The adhesive strands, which are applied molten, penetrate in part into the adjacent fiber layers, which has the effect of providing a good anchoring. The thickness of the adhesive layers is not of substantial significance for the bonding strength of the laminate, however. The bonding strength is dependent on the contact surface. With a full-surface application of a thin

adhesive layer, a stronger bond is produced than with a thick application of adhesive in strips or at adhesive spots. It would seem that the use of thick adhesive strips is a logical consequence because this would improve the bond between the layers. However, if an adhesive which hardens as rubber-elastic were applied in a thin layer on the fiber layers which are to be bonded to one another, then a strong laminate bond would be created which, however, would not be elastic. Under extension, the material bond would indeed be maintained, but the laminate would extend irreversibly, because the forces arising under the extension could not be absorbed by a thin layer of adhesive.

II. The Rejection

The U.S. Patent No. 5,415,925 to Austin et al. discloses a laminate of fiber-form layers (11, 13, 14), which are adhesively bonded to one another. In this situation, an adhesive is used which hardens to an elastic consistency. A uniform application of the adhesive results in a strong laminate bond.

Column 5, lines 5 to 10, of the patent describes how the adhesive is applied uniformly onto the surfaces which are to be connected to one another. The application volume

amounts to less than 5g/m^2, and preferably even less than 0.5 g/m^2 (Column 5, lines 13 to 16). With a uniform application of the adhesive, the layer thickness is calculated according to the following formula:

$$\text{Layer thickness} = \frac{\text{Application volume } (g/m^2)}{\text{Material density of the adhesive } (g/m^3)}$$

The melt adhesives indicated in Column 4, lines 55 to 60 -- e.g., styrol-butadiene-copolymers -- have a density of approximately 1 g/cm^3 (10^6 g/m^3). With a uniform application of the adhesive, the application volume indicated therefore corresponds to a layer thickness of between 0.5 µm and 5 µm.

With the laminate described in Austin et al., a flat, thin layer of adhesive is applied. Due to the flat application of the adhesive, a firm bond results between the fiber layers which are to be connected to one another. In this situation, a thin application of adhesive is therefore required in order to prevent the pores of the fiber layers from closing, so that the material has good gas permeability. The specification does not provide the person skilled in the art with any inspiration to apply the

adhesive in latticework form, or to make use of adhesive strands with a thickness of between 100 μm and 1500 μm.

The laminate described in Austin et al. is flexible and possesses good bonding strength. It is not elastic, however, because the thin layers of adhesive are not in a position to accommodate forces in an elastic manner when the material is stretched. When tensile stress is applied to the laminate, the material therefore extends irreversibly. In order to lend the material elasticity, it is not sufficient to make use of an adhesive which exhibits rubber-elastic properties at room temperature. Rather, it is additionally required that thick adhesive strands be provided for, which can absorb tensile forces as a rubber-elastic body.

In conclusion, therefore, the limitation recited in claim 21, that the adhesive strand exhibit a thickness of 0.1 to 1.5 mm, is not merely an optimization of the application volume within the framework of the teaching described by Austin at al. Rather, this feature lends the laminate new properties, namely elastic properties, which are not present in the prior art.

Accordingly, independent claim 21, as well as claims 22-26 which are dependent thereon, are believed to be in condition for immediate allowance.

The Office Action issued April 8, 2003 indicates that claims 9-19 are pending in this application but have been withdrawn from consideration. In fact, claims 9-19 were canceled pursuant to applicant's Amendment dated September 21, 2000. Claims 21-25 are the only remaining claims now pending in this application.

Respectfully submitted,

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July 31, 2003
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Date July 31, 2003